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FORMAT

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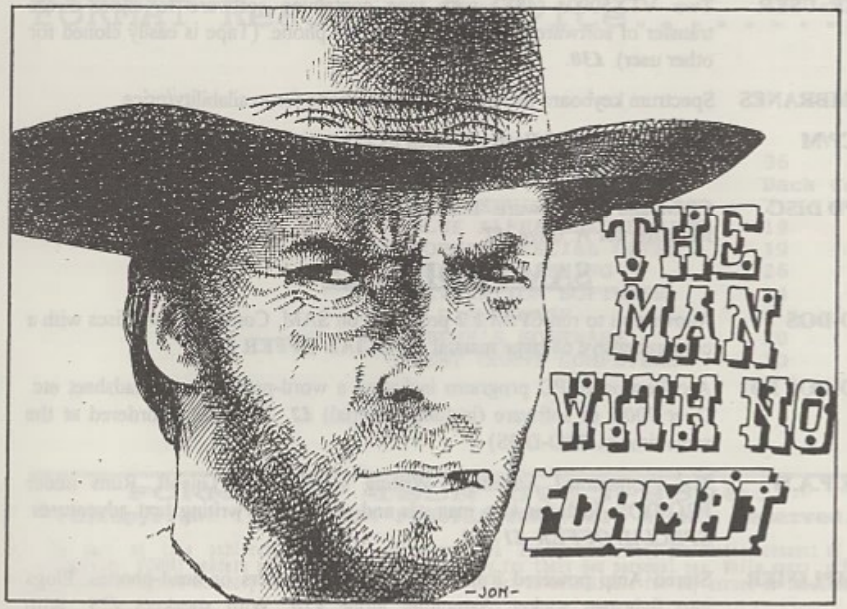

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NEWS ON 4

AMSTRAD BACK IN PROFIT

Alan Sugar's troubled company Amstrad seems to be pulling out of the depression if their profit figures for the second six months of 1992 are anything to go by.

Reporting a £13.5 million profit (£5.6 million after deducting certain exceptional items like reorganization costs) the company pointed to the buoyant sales of satellite equipment as one of the main reasons for the turn-around from the £16.2 million loss during the same half of 1991. The growth in fax machine sales and the sales of audio equipment were also helping the recovery.

However the sales of computers were causing major problems due to the very low margins they were being forced to work with. During the last quarter the devaluation of Sterling had left them with almost zero margins in many cases and this was now becoming a nightmare for the company. Alan Sugar has already hinted that he may look to split the computer division from consumer electronics and may indeed be looking for potential buyers.

ALL FORMATS VENUE CORRECTION

The All Formats Show scheduled for the 24th April will not be held at the Sandown Park venue as so far advertised.

The organizers apologize for any inconvenience this mistake in their adverts may have caused and would like to say that the correct venue for that day is at the NOVOTEL in Hammersmith, West London.

So remember NOVOTEL - 24th April - and the free tickets we sent out last month will be valid there.

SPREADSHEET GUIDE

A new book from Pangbourn based Kuma Computers Ltd called "Spreadsheets Made Simple" has just been published.

The book is designed to be compatible with most Spreadsheet programs and is designed to take you step-by-step through from basic principles to really complex financial models. They describe the book as being useful for all computer users but particularly managers, small businessmen, business studies students and most other non-financial professionals.

The book costs £12.95 (ISBN 07457 0076 4 and Kuma can be contacted on 0734 844335.

WHICH SHOW CRASH

The UK's best known computer show is no more. The WHICH COMPUTER? SHOW, once one of the most important dates on the European computer show calendar, which was to have been held at the NEC in April been cancelled due to poor bookings from exhibitors.

After 12 years as Britain's major showcase exhibition the show had experienced a decline in attendance over the last 3 years (last years figure was 53,000 visitors) but without a certain level of exhibitors the organizers felt unable to continue.

ONE THIRD RISE IN DISC PRICES

Blank disc prices look set to rise by up to 33% if the European Commission get their way.

Plans for an anti-dumping directive are being drawn up by the commission following an appeal from a European disc manufacturing trade body called Diskma concerning cheaper Far Eastern imports. This could mean a levy of between 20% and 40% being imposed for an indefinite period.

While full price software is unlikely to be affected the more budget minded software houses may not be able to absorb the increase when it comes. Many of the high-street mags for machines like the Amiga and PC would also be hit very hard by such a large price rise.

NIGHT OF THE LONG KNIVES FOR 8 BITS

Within days of each other both W.H.Smiths and John Menzies announced that they were to stop selling software for 8 bit computers like the C64, CPC and Spectrum.

Smiths are to concentrate shelf space on the Amiga and PC only while Menzies will lean more towards the console market.

Even the Atari ST is not immune from the savage cuts with both companies banishing ST software from their shelves.

W.H.Smiths was the first high street retailer to stock software way back in 1981 and they have carried Spectrum software since September 1982. They admit that after 10 years it will be a major landmark when the last Speccy title is sold from the shelves but claim that as so few full price games are being developed for the machine it does not justify the shelf and stock-room space anymore.

GAMES WORLD LAUNCHED

Sky One's new computer/video show GAMES WORLD got off to an ambitious start in it's five nights a week slot at 6pm on the 1st March.

The show aims to keep things fresh with a different theme to each nights programme. Various features including a knock-out games tournament, reviews, playing tips and a 'Beat the Elite' challenge are lined up for early shows but the producers will 'play things by ear' and be responsive to the demands of their audience.

Scheduled into this early evening slot, right after the highly successful STAR TREK: The Next Generation, Games World looks set to head a major push by Sky's owners BSkyB to grab even larger audiences away from terrestrial TV during the coming months.

News Credits: Paul Drew.

URGENT we need your news. Anything you think other people should know about. Items printed earn contributor 3 months extra subscription (please claim when renewing).

This last week has been a complete disaster. First I get a cold - just at the wrong time when I need an alert and active mind to edit FORMAT [any comments on my normal state of mind will be treated with the contempt they deserve]. But worse was still to come, the BBC died - half way through producing this issue. Now for those of you new to FORMAT I should explain that my BBC computer was used for type-setting the magazine. As luck would have it that 'Very Nice Man' John Wase (Mr Short Spot himself) just happened to have a BBC Model 'B' in his possession and has very kindly come to the rescue by loaning it to use until mine can be repaired. Many thanks John, you saved my life.

However this has made FORMAT both late and a little less varied than usual. I've crammed in as much as I could in the time available but some things have had to be held over until next month. Funny thing is, it was last March's issue that blew up my printer - there's a coincidence now...

Several readers have asked for more articles on computer languages other than Basic and Machine Code. Well we now have a series being written on Pascal, a language much loved by educationalists, but how about others? If anyone has something to say, aimed at beginners or the more advanced programmer, get in touch please.

In the December issue we printed the Super Golf game for you to type in. I know from your calls and letters that many of you did take the time to type it in and many more of you have purchased the disc copy. What surprised me is that so far there has only been two readers send in suggestions for improvements. Come on now, don't be shy, let's see your efforts.

Bob Brenchley. Editor.

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SHORT • SPOT

Edited By:- John Wase.

February's here, and I'm sifting through the post again. I've got an enormous pile here, a combination of the problems arising from Bob's jury service, the post and sheer haste. Muggins has also taken on parts of two new degree courses, giving me much more work than I thought I was going to pick up, particularly evening work. What happens? The big pile is left to the last possible moment and has assumed monumental proportions. So, if the offering you sent last November has not yet appeared, do bear with me: it could well still be on the way.

Right, let's have a look at that pile of post. Strewth; it's dusty! So; we start at the bottom....

I often start off with Alan Cox. This month is no exception, as in the intervening period, I've had several bits and pieces from him. The one that really took my eye is this. Now, if you use a PC, you'll know all about viruses. Computer viruses, that is. They are nasty bits of code that transfer themselves into the "works" of a computer, and either interfere with programs (usually at a later, sometimes specific, date) or more ominously they ruin the works. They are particularly difficult if you have a good sized hard disc and are stupid enough to keep all your essential text and data files on it, rather than on duplicate floppies. They can do things like trash the File Allocation Table (the directory, essentially), or even make the thing reformat. They usually add a little bit to various applications on the disc, and on any floppy you put in, and so multiply, and are handed around. Some of the less malevolent ones are merely a nuisance, like the ones that cause all the letters on-screen to drop to the bottom, or make some creature crawl round, eating the letters up.

Fortunately, there are fewer opportunities with SAM and Spectrum: the whole of the operating system's in ROM, apart from the boot disc for the DOS, and the capacity of the floppies is relatively small. As the first thing you do is to boot, then you put the boot disc away, the chance of writing back something to the directory of a later disc is relatively small, and even if you do, it's likely to be got rid of when the computer is turned off. The only danger lies in running other stuff on already booted machines. Fortunately, Spectrum and SAM owners are likely to have more sense...

Anyway, Alan's noticed all this nonsense; like me, he also has to suffer the progeny of Big Blue. So he's written a couple of little SAMbits that look rather like viruses. Try these for size. The first one's called "cascade".

```
 10 RESTORE 150: LET a$="": FOR n=1
    TO 32: READ b: LET a$=a$+CHR$ (b
    ): NEXT n
 15 FOR n=0 TO 31
 20 FOR b=1 TO 5: PRINT AT b,n;"*":
    NEXT b
 30 LET z=1+RND(4): PRINT AT z,N;a$(
    n+1)
 40 FOR b=z+1 TO 5: PRINT AT b,n;CHR
    $ (65+RND(25)): NEXT b
 50 NEXT N
 52 GOSUB 55
 53 GOTO 60
 55 PRINT AT 15,0;"PRESS ANY KEY": P
    AUSE : PRINT AT 15,0;STRING$(13,
    " "): RETURN
 60 FOR 1=1 TO 5
 70 FOR x=0 TO 255 STEP 8
 80 IF SCREEN$(6-1,INT (x/8))= "*" T
    HEN PRINT AT 6-1,INT (x/8);" ":
    GOTO 120
 90 FOR y=120+9*1 TO 1 STEP -1
100 SCROLL 4,1,x,y,8,9
110 NEXT y
```

```
115 BEEP .05,1
120 NEXT x
130 NEXT l
135 GOSUB 55
140 CLS : GOTO 15
150 DATA 70,79,82,77,65,84,32,73,83,
    32,66,69,83,84,32,70,79,82,32,65
    ,76,76,32,83,65,77,32,85,83,69,8
    2,83
```

The next one's called "caterpilla" (sorry about the spelling, but there's only ten letters allowed).

```
 10 REM caterpilla
 20 REM by Alan Cox
 30 DIM tum$(5)
 40 MODE 1
 50 scr:cat:go
 60 STOP
 70 REM
 80 DEF PROC go
 90 FOR l=1 TO 11
100 LET a1=1-2,a2=34-2*l,a3=57-4*l,a
    4=90-6*l
110 FOR x=1 TO 112-8*l
120 LET xx=1+(x-1) MOD 5
130 PRINT AT FN r(x-5),FN c(x-5);tum
    $(xx);
140 LET tum$(xx)=SCREEN$(FN r(x+1),F
    N c(x+1))
150 PRINT PEN 2; AT FN r(x),FN c(x);
    CHR$ (150)
160 PRINT PEN 4; AT FN r(x-1),FN c(x
    -1);CHR$ (150)
170 PRINT PEN 4; AT FN r(x-2),FN c(x
    -2);CHR$ (150)
180 PRINT PEN 4; AT FN r(x-3),FN c(x
    -3);CHR$ (150)
190 PRINT PEN 4; AT FN r(x-4),FN c(x
    -4);CHR$ (150)
200 NEXT x
210 NEXT l
220 END PROC
230 DEF FN c(x)=((l-2) AND (l>1 AND
    x<l))+((x+a1) AND x>0)+((a2-x) A
    ND x>a2) +(a3-x AND x>a3)+((x-a4
    ) AND x>a4)
240 DEF FN r(x)=((l-1-x) AND (l>1 AN
    D x<l))+((l-1) AND x>0)+((x-a2)
    AND x>a2)+((a3-x) AND x>a3)+((a4
    -x) AND x>a4)
250 DEF PROC cat
260 RESTORE 300
270 FOR n=UDG CHR$ (150) TO UDG CHR$
     (150)+7
280 READ b: POKE n,b
290 NEXT n
```

```
300 DATA 60,126,255,255,255,255,126,
60
310 END PROC
320 DEF PROC scr
330 LET z$="ABCDEFGHIJKLMNOPQRSTUVWX
YZABCDEF"
340 FOR t=0 TO 21
350 PRINT z$
360 NEXT t
370 END PROC
```

By the way, if you run this right through, it fails on the last circuit. Bit inelegant, isn't it. Anyone like to clean it up? Also naughty Alan has used lower case L as a variable name - everyone please remember that's not allowed.

You know, the simple things in life seem to please many of our readers. Chris Dodd's little snippets, perfectly straightforward, have kept the postman busy. You remember his little program called "twirl" on page 13 of last December's issue? Well, if you don't, it put curly wurly tubey things on the screen. "Tube" was somewhat similar, if I recall. Thing is, both programs did something which altered the palette and made the picture on my TV very dim. Rather like me. I therefore appealed to our good readers. Here's some of the answers. The first one's not quite unique, but it's so nice to have a letter from a young lady for a change. Toni Whiston of Dalcataig, Glenmoriston, wrote in to say that she is a novice programmer (so am I, Toni), but she had sussed out that a change in the value of "S" in either program will substantially improve matters. Values of 9 - 15 (max) give the best results in both cases. Toni also mentions that you can also change the "STEP -1" factor to -2 or -3, giving interesting colour variations. You're not that much of a novice, Toni, to have spotted that.

Andrew Rycroft, of Barnet, Herts, also has been able to throw a little light on the subject. Here's his suggestion:-

```
 5 INPUT "Input a number between 1
   and 127";p
 6 PALETTE 0,p
 7 INPUT "Input a number between 1
   and 10";r
45 FOR h=1 TO 123-r
50 FOR a=1 TO 15: FOR s=4+h+r TO 0+
   h STEP -1: LET c=c+s-h: IF c>15
   THEN LET c=c-15
60 PALETTE c,s: NEXT s: NEXT a: NEX
   T h
70 PAUSE 30: PALETTE
```

This, says Andrew, uses all the colours SAM is capable of displaying. Also, when it's running, it takes a while to warm up, as it were. Green backgrounds are the least effective. Finally, Andrew adds a p.s. "If you change 120 to 300 in line 10, it becomes more solid. Many thanks for all that information, Andrew.

Alan Cox, of St Clears, Dyfed (again), has also investigated this problem. He mentions that to get a reasonably visible picture, you need s*17 in the PALETTE statement in line 60, instead of s. And he then goes on to give quite a full explanation. Essentially (he says), the basic problem with Chris's programs, and, for that matter, his own "sunset" program with the dreary coloured sun, is that we were both thinking of the second parameter in the PALETTE command in Spectrum terms, not SAM. The first parameter is merely a "label" for one of the 16 available "slots" in the palette, which are called up in the PEN and PAPER commands. The second parameter defines the colour that is put in the appropriate slot, and is analogous to, but not identical with, the Spectrum attribute byte.

As the Technical Manual points out (in Alan's copy of version 3.0, p19, but there are, apparently, some misprints), SAM uses 7 bits to define colours. Bits 0, 1 and 2 are the less significant bits for blue, red and green; bits 4, 5 and 6 are the more significant bits for blue, red and green. Bit 3 is referred to as BRIGHT, but when the bit is set, you actually get reduced intensity, so Alan thinks it really ought to be called DULL!

When SAM is initialised, it creates a default palette by setting to 1 the MSB for the appropriate colour(s) that correspond to PEN 1 to 7, and both the MSB and the LSB for PEN 8 to 15. This means that the palette numbers for PEN/PAPER colours 1 to 7 are 16*(1 to 7) and for PEN/PAPER colours 8 to 15 are 17*(1 to 7).

Here is a program to illustrate this point. The program "palettest" first draws a row of squares in ordinary colours, and then the BRIGHT equivalent below them. Each keypress then alters the palette for the top row to incorporate the factor of 17, whereupon the top row square matches the colour of the bottom one.

```
 10 REM test of palette
 20 FOR i=1 TO 7
 30 PRINT PEN i; AT 10,8+2*i;""
 40 PRINT PEN 8+i; AT 11,8+2*i;""
 50 NEXT i
 70 FOR i=1 TO 7
 75 PRINT #0; AT 0,0;"Press any key"
    : PAUSE
 80 PALETTE i,i*17
100 NEXT i
110 PALETTE
```

Let's push this a little further. The next program is an adaptation of the colour demonstrations in the SAM Manual. It shows, for each line of colour, the bits corresponding to the colour value, so that you can now see on screen (well, at least on Alan's), how the DULL bit reduces the colour levels, and how dominant the MSB is for any given colour. If the MSB is set, then the LSBs have very little effect. Many thanks, Alan. I'm sure this will move things forward, and that we'll get some more replies about colour.

```
  5 GOTO 95
 10 PRINT AT 0,1;"MMMHLLL"
 20 PRINT AT 1,1;"SSSASSS"
 30 PRINT AT 2,1;"BBBLBBB"
 40 PRINT AT 3,1;"GRBFGRB"
 50 PRINT AT 4,1;"REL REL"
 60 PRINT AT 5,1;"EDUBEDU"
 70 PRINT AT 6,1;"E EIE E"
 80 PRINT AT 7,1;"N  TN"
 92 RETURN
 95 FOR c=0 TO 127 STEP 8
```

WEST COAST COMPUTERS

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Below you will then find details of the range of SAM hardware that is now available from us. Some items we know will be in great demand so we deal with orders on a strict 'first come - first served' basis.

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W1303	MIDI Cable Set	£6.95

E.& O.E. Prices valid, subject to availability, until 1st September 1993.

UK Postage & Packing: Add £10 for computers (sent by insured carrier). All other items add £1 per item (max £5).

Overseas customers: Please write for quote on Airmail Insured Delivery Service.

Write your order clearly on a reasonable sized piece of paper, state your name; address and phone number. Cheques, Postal Orders, Euro-cheques should be made payable to West Coast Computers Ltd. We will try to dispatch your orders as quickly as we can - however please allow 28 days to be on the safe side.

There are other item not listed above (including the long awaited Video Digitiser) which will be available in the next few months - watch out for our next advert.


```
 97 GOSUB 10
100 PRINT AT 8,0;
110 FOR p=0 TO 7
120 PALETTE p+8,p+c
130 PRINT BIN$ (p+c); TAB 9; PAPER p
    +8;STRING$(18," "); PAPER 0;" ";
    p+c
140 NEXT p
145 FOR i=8 TO 15: PRINT AT i,0;" ":
     NEXT i
150 PRINT
160 PRINT "Press any key"
170 PAUSE
180 CLS
190 NEXT c
200 PALETTE
210 STOP
220 DEF PROC sv: SAVE "paletbits": E
    ND PROC
```

Now a bit about the Spectrum. There isn't as much post about the Spectrum as usual, so that's why there isn't so much printed. Sorry, all you Spectrum fans - you know the remedy! GET WRITING.

Anyway, we're not completely devoid. For instance, Mr Eric Olyott of Portsmouth, writes about a cry for help by Roy Burford of Stourbridge. You remember that Roy has a 128 Spectrum and an 8056 printer, and wanted information about screen dumps. Eric writes that he too has an 8056 printer; moreover, he's now bought a DMP3160 Amstrad, so if anyone wants the 8056, they can have it for the price of the postage. That's a very generous offer, Eric; hope the postman doesn't overwhelm you. If you want your name and address passed on, please ring Bob; first one gets it.

Meanwhile, here's some information about the 8056. It plugs straight into the RS232 socket of the Sinclair 128 (you know, with the heat sink on the end, but no tape recorder). Two very important codes for this printer are:- POKE 23349,39: POKE 23350,1.

This will turn OFF the Spectrum's filtering out the control codes to the printer. Now, here's the magic bit. Eric's also included a program for giving screen dumps, both large and small. Bless you, Eric.

```
 10 CLS : LET a$="8056 COPY"
 20 PRINT AT 0,16-LEN A$/2;A$
 30 PRINT AT 2,4;"The following code
    is for  use with an 8056 PRINTER
    ."
 40 PRINT "    It will give a normal
    size  screen dump + a large scree
    n    dump, graphics or otherwise.
    "
 50 PRINT "    The code is relocatabl
    e."
 60 PRINT "    I make NO CLAIM to thi
    s code whatsoever as I got it fro
    m the' CRASH-TECH-TAPE ' (CRASH)
       computer magazine many eons a
    go."
 80 PRINT '"TO USE :-"
 90 PRINT "CLEAR 64503"
100 PRINT "LOAD CODE 64504,288"
110 PRINT "POKE 64551,0 (LARGE SCREEN
     DUMP)"
120 PRINT "POKE 64551,1 (NORMAL SCREE
    N DUMP"
130 PRINT '"I hope MR ROY BURFORD ( F
    ORMAT  VOL.5, NO 9,letters (page
    34)  will find this useful.": PA
    USE 0
200 DATA 33,53,91,54,196,35,54,247,33
    ,94
210 DATA 91,54,20,35,54,110,205,0,91,
    33
220 DATA 114,91,54,43,62,10,205,163,8
    ,42
230 DATA 53,91,229,62,27,205,163,8,62
    ,48
240 DATA 205,163,8,33,0,175,62,1,167,
    32
250 DATA 119,229,6,2,197,229,62,27,20
    5,163
260 DATA 8,62,75,205,163,8,175,205,16
    3,8
270 DATA 62,1,205,163,8,225,6,16,197,
    229
280 DATA 6,8,14,0,229,197,6,4,209,213
290 DATA 62,9,146,197,71,197,229,193,
    197,205
300 DATA 0,91,205,170,34,205,0,91,126
    ,225
310 DATA 193,203,39,16,252,245,203,17
    ,241,203
320 DATA 17,37,209,66,16,218,121,245,
    205,163
330 DATA 8,241,205,163,8,193,225,16,2
    01,225
340 DATA 193,62,8,133,111,16,187,193,
    16,160
350 DATA 62,10,229,205,163,8,225,225,
    17,0
```

```
360 DATA 4,237,82,124,254,255,32,139,
    24,100
370 DATA 229,62,27,205,163,8,62,75,20
    5,163
380 DATA 8,175,205,163,8,62,1,205,163
    ,8
390 DATA 225,229,6,32,197,229,6,8,14,
    0
400 DATA 229,197,6,8,209,213,62,9,146
    ,197
410 DATA 71,197,229,193,197,205,0,91,
    205,170
420 DATA 34,205,0,91,126,225,193,203,
    39,16
430 DATA 252,203,17,37,209,66,16,222,
    121,205
440 DATA 163,8,193,225,16,210,225,193
    ,62,8
450 DATA 133,111,16,196,62,10,205,163
    ,8,225
460 DATA 17,0,8,237,82,124,254,255,32
    ,156
470 DATA 62,27,205,163,8,62,50,205,16
    3,8
480 DATA 225,34,53,91,205,0,91,201,0,
    0
```

Now back to SAM for a minute. 'Cos I've dropped a clanger, I left a bit out of Ettrick Thomson's program about "DEFKEY". Ettrick writes far too kindly to point out that "the sentence "23681 normally contains 91, and 91 * 256 = 23296, the first byte of the display file." should have read:"23681 normally contains 91, and 91 * 256 = 23296, the first byte of the printer buffer. The program POKEs 23681, the first value being 64; 64*256=16384, the first byte of the display file. It should be obvious to careful readers that what is printed is nonsense."

My apologies, Ettrick - a late-night transcription of your letter when under pressure was to blame for the errors; entirely mine. The fact that they were printed, however, has also stirred poor Andy Wright into writing. Sorry, Andy; my fault, and I apologize.

Andy also mentions the vexed question of character sets. You CAN redefine CHR$ 128-168 by pointing UDG (&5C7B) to another character set. Remember to enter BLOCKS), or you won't see CHR$ 128-143 as anything but block graphics. To redefine CHR$ 169-254, you must alter HUDG (&5C7D). Unfortunately, all character patterns must be in page 0.

Then he adds a little P.S.... "This is confusing because I used CHARS to point at CHR$ 32-127, and UDG to point to CHR$ 144 upwards, LIKE THE SPECTRUM. To allow CHR$ 128-143 to be redefined, I used UDG MINUS an offset for the particular character.

In the original ROM version (never released), only 128 upwards could be redefined, so it made sense to use UDG as a pointer...."

Andy also encloses a little Short Spot for me, as follows...

```
10 POKE 16384,MEM$(UDG " " TO UDG C
   HR$ 168+7): REM copy char set
20 FOR N=16348 TO 16348+137*8 STEP
   8: POKE n, PEEK n BOR 128: NEXT
   n: REM mark characters to prove
   it works
30 DPOKE &5c36,16384-256:REM alter
   CHARS
40 DPOKE &5c7b,16384+96*8: REM alte
   r UDG
50 FOR n=32 TO 168: PRINT CHR$ n;:
   NEXT n
```

Many thanks, Andy. Hope that's all clear, now.

Now back to the Spectrum. Roy Burford of Stourbridge wrote late last year about "Renumber", and has had some more thoughts. He was reading back numbers of FORMAT (a rewarding activity, actually), and he came across Nev's "Help Page" p29, Vol 13, No10, June 1990 on the subject of "POKE @", and realised that this could be used to change the variables in the 128k renumber routine. Nice one!

```
9989 STOP : REM Change 128K Renumber v
     ariables.
9990 INPUT "Start line number(1-65535)
     : ";s$: FOR t=1 TO LEN s$: IF COD
     E s$(t)<48 OR CODE s$(t)>57 THEN
     LET t=LEN s$: NEXT t: GOTO 9990
9991 NEXT t
9992 IF VAL s$<1 OR VAL s$>65535 THEN
     GOTO 9990
9993 INPUT "Increment number(1-65535):
     ";i$: FOR t=1 TO LEN i$: IF CODE
     i$(t)<48 OR CODE i$(t)>57 THEN L
     ET t=LEN i$: NEXT t: GOTO 9993
9994 NEXT t
9995 IF VAL i$<1 OR VAL i$>65535 THEN
     GOTO 9993
9996 POKE @(23444-8192),VAL s$: IF VAL
      s$<256 THEN POKE 23445,0
9997 POKE @(23446-8192),VAL i$: IF VAL
      i$<256 THEN POKE 23447,0
9998 STOP
9999 GOTO 9990
```

If you look at the listing, you will see that to start it, do a "RUN 9999". "You could not" writes Roy, "use a start line number or a step anywhere near as great as 65535, but it's left in as this is the maximum POKE @ can correctly handle. The offset of 8192 in lines 9996/7 is for the Plus D interface; for the Disciple, it's 664. One could enhance the program to cover both.

The snag, of course, is that if the utility is merged with a program to be renumbered, then it becomes renumbered also unless removed after use. On my Spectrum+ 128k, I can keep a copy of the utility in RAMdisc or LOAD/MERGE from a drive".

Many thanks, Roy.

In addition, Roy would like to add to the list of impossible objects we've been looking at. Here's his program, called "Eyeteasers".

```
 1 REM Source: Nestle. Shreddies pac
   ket. Eye Teasers.
 2 REM Data derived for ZX Spectrum+
    128K by B.C.R.Burford 190992.
10 PRINT #0;AT 0,10;"Eye Teasers"
20 READ a,b,c
30 IF a>1 THEN GOTO 70
40 IF a=0 THEN PLOT b,c: GOTO 60
50 DRAW b,c
60 GOTO 20
70 PRINT AT 20,2;"Incredible box";TA
   B 20;"Groove?"
80 PRINT #0;AT 1,4; FLASH 1;"Press a
   ny key to exit: ": PAUSE 0
90 STOP
100 DATA 0,62,30,1,-31,20,1,46,28,1,3
    1,-19,1,-46,-29,0,62,37,1,-22,13,
    1,37,22,1,21,-13,1,-36,-22
110 DATA 0,31,50,1,0,66,1,47,28,1,30,
    -19,1,-46,-29,1,-31,20,0,41,116,1
    ,37,21,1,20,-12,1,-36,-23,1,-20,1
    3
120 DATA 0,71,82,1,-35,-22,1,0,46,1,2
    0,-12,1,0,-21,0,71,82,1,-35,-22,1
    ,0,46,1,20,-12,1,0,-21
130 DATA 0,71,82,1,0,11,1,31,21,1,0,-
    43,1,-20,12,1,0,17,0,48,113,1,30,
    17,1,14,-8,0,77,137,1,0,-24,0,82,
    128,1,0,-13
140 DATA 0,71,126,1,0,-18,0,108,125,1
    ,0,-66,0,98,111,1,0,-37,0,77,97,1
    ,0,-19,0,62,96,1,0,-20,0,68,80,1,
    0,11,1,3,2
150 DATA 0,41,103,1,0,-40,0,46,53,1,1
    6,-10,1,31,19,0,56,59,1,0,-12,0,6
    2,63,1,0,-25,0,68,66,1,0,-19
160 DATA 0,165,50,1,7,-4,1,7,4,1,0,73
    ,1,-7,4,1,7,5,1,-14,8,1,0,-90,0,1
    72,46,1,0,81,0,165,140,1,13,8,1,2
    8,-17,1,-13,-8,1,-7,4,1,-7,-4
200 DATA 0,186,127,1,0,-90,1,7,-4,1,0
    ,90,0,179,50,1,7,-4,0,193,33,1,13
    ,8,1,0,90,5,5,5
```

Finally, Roy is often puzzled by references, good and bad, to the various Spectrums, and this was highlighted when he read the Special Anniversary "Format" last September. He wondered if anyone had, or could produce, a tabulated list of all the Spectrums, giving comparitive advantages/disadvantages to the first one. Make a nice little addition to 'Short Spot", wouldn't it. Anyone like the job, or done it?

And that's all for now, folks. My thanks to all who have sent - please keep it up. It's great; virtually everything's coming in as I like it; on disc, with an accompanying printout and description. Great stuff: makes my life so much easier.

Please keep your items coming to:-

John Wase,
Green Leys Cottage,
Bishampton,
Pershore,
Worcs, WR10 2LX.

and I'll try to put an interesting column together for you. Looking forward to next month. See you!

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MACHINE CODE WITHOUT THE TEARS

Part 16.

By:- Carol Brooksbank.

Last month, I told you that the Spectrum has 8 address and 5 data lines for the keyboard. Sam has more keys, so there are 9 address lines and 8 data lines. Address lines A8-A15 on Sam are, like the Spectrum, connected to bits 8-15 of the address bus. They are activated in exactly the same way, by sending a word with the bit for the line we want to activate low.

Data bits D0-D4 are read in exactly the same way as the Spectrum - bits 0-4 of the byte read from port 254. D5-D7 are bits 5-7 of the byte read from the STATUS port, port 249.

The extra address line is found by using Sam's mouse read line. This line is only used, in fact, to read the arrow keys and the CNTRL key. There are no keys connected to D5-D7 when we are using address line A16. But the fact that the mouse read line is involved in keyboard scanning means that the mouse's presence can corrupt the scan. If you have a mouse it is safest to disconnect it while we are writing and testing these routines.

If you compare Fig.1 with last month's fig.2 you can see how similar they are. If you disregard the keys connected to A16, and the ones read from port 249, the rest of the Sam chart is identical to the Spectrum's.

This means that the little bits of code I gave last month for testing for keys Q and P will work with Sam too. It is one of the reasons why so many Spectrum programs can be converted to run on Sam, or to run under an emulator. I said that the key switch layout looks odd to a Spectrum user unless he has a rubber-key Spectrum, but it looks even more odd to a Sam user. If you compare the D0-D4 keys on address line A15, - "B N M SYM SP" - with the Sam keyboard it seems to make no sense at all. The keyboard goes - "B N M , ." but by retaining the old Spectrum pattern, Sam's designers made Spectrum emulation much easier.

The main difference, then, in testing for particular keys on Sam, is that you will have to use IN A,(249), or LD C,249 - IN A,(C) to read in the data byte for the function keys, some of the punctuation keys, CAPS, TAB, ESC etc., and use BIT 5, BIT 6, and BIT 7 instructions to test for the keypresses. Just as with the Spectrum, a low bit, NZ, will indicate that the key has been pressed. To test for the arrow and CNTRL keys, you must LD A,255 or LD B,255 depending on which instruction you are using.

So now we will write a program to test for Q A O P - as though we are using them for cursor control UP DOWN LEFT RIGHT. If two keys are pressed at once, we must test whether they are valid - Q+O is fine - meaning diagonally UP/LEFT. Q+A is invalid - you can't go UP/DOWN at the same time. We shall use key X as an exit key to return to BASIC. Testing for a'l these keys is the same on Spectrum and Sam.

Just to demonstrate that the method works, we shall print a message to screen to say which direction is represented by the keypress or "INVALID" if the combination would be impossible. We shall not worry about whether the key was upper or lower case - we shall not test CAPS or SHIFT - just whether the character key was pressed. If any other keys than Q A O P X are pressed there will be no response from the keyboard.

```
        ORG ????? (you choose)
START   LD A,254
        IN A,(254)
        BIT 2,A
        RET Z
```

SAM KEYBOARD

LINE	BIT	HI BYTE BIN	HI BYTE DEC	DATA BIT 7	6	5	4	3	2	1	0
A8	0	11111110	254	F3	F2	F1	V	C	X	Z	SHIFT
A9	1	11111101	253	F6	F5	F4	G	F	D	S	A
A10	2	11111011	251	F9	F8	F7	T	R	E	W	Q
A11	3	11110111	247	CAPS	TAB	ESC	5	4	3	2	1
A12	4	11101111	239	DEL	+	-	6	7	8	9	0
A13	5	11011111	223	F0	"	=	Y	U	I	O	P
A14	6	10111111	191	EDIT	:	;	H	J	K	L	RET
A15	7	01111111	127	INV	.	,	B	N	M	SYM	SP
A16	8	11111111	255				>	<	^	v	CNTR
				PORT 249			PORT 254				

Fig 1.

We begin by testing for key X - the signal to exit the machine code routine. The test for X is address line A8, data bit D2. Use the diagrams to check this to make sure you undertand why the values used check for a particular key. If BIT 2 of the data byte is 0, X was pressed we return to BASIC.

```
        LD BC,12900
DEBOUN  LD A,C
        OR B
        DEC BC
        JR NZ,DEBOUN
```

This is a debounce routine, to stop the keypress repeating before we have time to let go of the keys. You may be astonished that we have to loop 12900 times, but try varying the routine to load lower numbers into BC. You will find it very difficult to press the key just once with a much lower number. The number loaded into BC can be varied slightly, though, to give a lighter or heavier keyboard response.

```
        LD HL,STORE
        LD (HL),0
```

We are going to build up a byte at the location STORE, from which, at the end of the scan, we can deduce what keys were pressed. We begin by clearing the byte.

```
CHKQ    LD A,251
        IN A,(254)
        BIT 0,A
        JR NZ,CHKA
        SET 0,(HL)
```

We check whether Q was pressed. If not, we jump forward, but if it was, BIT 0 of our STORE byte is set.

```
CHKA    LD A,253
        IN A,(254)
        BIT 0,A
        JR NZ,CHKP
        SET 1,(HL)
```

Check for A pressed, and set BIT 1 of STORE if it was

```
CHKP    LD A,223
        IN A,(254)
        BIT 0,A
        JR NZ,CHKO
        SET 2,(HL)
```

If P is pressed set BIT 2 of STORE.

```
CHKO    BIT 1,A
        JR NZ,EVAL
        SET 3,(HL)
```

O is on the same address line as P, so we test it straightaway from the same data byte. If pressed, BIT 3 of STORE is set.

```
EVAL    LD A,(HL)
        CP 0
        JR Z,START
```

We now begin to evaluate the byte we have built up at STORE. It is loaded into A, and tested first for zero. If no bits have been set in it, no keys we are interested in have been pressed so we jump back to scan again.

```
        CP 11
        JR C,DISP
        LD HL,MESS+4
        JR PRMESS
```

If the byte is higher than 10, the keypress was invalid. The way we have set the bits means that the keys have the following values:-

Q=1, A=2, P=4, O=8.

A single keypress will give the appropriate value. The valid double keypresses will be:-

Q+P=5 Q+O=9 A+P=6 A+O=10

The invalid keypresses will be:-

Q+A=3 P+O=12

and between 1 and 10, 7 will also be invalid because it can only be arrived at by Q+A+P, and Q+A is invalid.

So, if the byte is higher than 10, we need to print the message "INVALID". We jump forward to print it. It will become clear in a minute how the action taken here will lead to that message being printed.

```
DISP    DEC A
        ADD A,A
        LD C,A
        LD B,0
        LD HL,MESS
        ADD HL,BC
```

We shall have a list of messages, but they are all different lengths, so rather than bulk them out with spaces so that they all match, we shall keep a table of their start addresses. The table is labelled MESS. If the byte is between 1 and 10, we now turn it into a displacement byte to point us to the place in the table where we can pick up the address of the right message for the keypress.

First, we DEC A, because if the byte was 1 we shall need the first message, and its address will be stored in the table at MESS+0. Then, we double it, using ADD A,A, because each address in the table uses two bytes. We then transfer the displacement to BC, add it to the start of the table in HL, and HL now points to the place where we can find the address of the message we want. MESS+4, used a few lines earlier, will point to the "INVALID" message used if Q+A was pressed and STORE held 3. (3-1=2 2+2=4)

```
PRMESS  LD A,(HL)
        LD E,A
        INC HL
        LD A,(HL)
        LD D,A
```

```
        PUSH DE
```

The message address is put in DE and stacked.

```
        LD A,2
        CALL 5633 (Spectrum only)
        CALL 274 (Sam only)
```

The old familiar routine opens a channel for printing to the upper screen.

```
        POP HL
PRLOOP  LD A,(HL)
        CP 255
        JR Z,START
        RST 16
        INC HL
        JR PRLOOP
```

The address of the message is fetched in HL, and the byte stored there fetched. 255 is used for an end marker to each message, so when that is found the message is complete and we jump back to START for another keypress. Until then, each message byte is printed using our old friend RST 16, and HL moved on to the next byte.

```
STORE   DS 1
MESS    DW UP
        DW DOWN
        DW INVAL1
        DW RIGHT
        DW UR
        DW DR
        DW INVAL2
        DW LEFT
        DW UL
        DW DL
```

Here we have the location of our STORE byte and the table of message start addresses.

```
UP      DM "UP"
        DB 13,255
DOWN    DM "DOWN"
        DB 13,255
INVAL1  DM "INVALID"
        DB 13,255
RIGHT   DM "RIGHT"
        DB 13,255
UR      DM "UP/RIGHT"
        DB 13,255
DR      DM "DOWN/RIGHT"
        DB 13,255
INVAL2  DM "INVALID"
        DB 13,255
LEFT    DM "LEFT"
        DB 13,255
UL      DM "UP/LEFT"
        DB 13,255
DL      DM "DOWN/LEFT"
        DB 13,255
```

Finally, the messages themselves, each followed by a CHR$ 13 (new line) byte and the terminator 255. There are ten messages in the right order for the possible values built up in STORE.

```
END     EQU $
LENGTH  EQU END-START
```

Save your source code, assemble it and call the machine code from you ORG address. Don't use PRINT USR because it will cause stray numbers to corrupt the messages.

You can press any of the keys singly or in combination, and X when you are tired of the whole thing and want to return to BASIC. The program shows you that key testing like this really does work.

In a real program, of course, we should do more than simply print messages in response to a keypress, but this program shows you how to evaluate a keypress to determine whether particular keys have been pressed. Try writing your own programs to read a different keypress and take some action. You could combine it with programs we have already written - a particular keypress makes the tractor move across the screen, for instance.

You probably noticed that last month I used RRCA and checked the carry flag, and this month BIT 0 etc. and checked the zero flag to determine whether a key had been pressed. Both are effective. RRCA changes the byte in A, but that does not matter when we only want to check the bits. RRCA is particularly useful in loops when you want to check all the bits of a byte in order. BIT tests leave the byte unchanged, but need a different instruction for every bit. If you use IN A,(C) to read in the data byte, you can load B with BIN 11111110 and use RLC B as a counter for the loops testing lines A8-A15. The low bit will move one bit to the left on each pass. On each RLC B, bit 7 is moved to bit 0 and copied to the carry flag, so JR C is used for the loop. After A15 has been checked, the low bit will be copied to the carry flag - no carry - so the loop exits.

We will leave the keyboard there, and next month we will start to look at the floating point calculator. See you then.

'I know, but have you ever tried opening the containers?'

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PROBLEM SOLVING
WITH YOUR COMPUTER

By:- Don Thomasson.

This month's dose brings you, a solution, a problem, and a discussion on the inability of computers to use insight.

The emphasis on prime numbers last month should have provided a fairly broad clue to the solution of the problem propounded. Remember that the members of the club paid up a total of £2088.60, and if the secretary had contributed the extra penny towards his own present the total would have been £2088.61. Even without the hint, experienced problem-solvers would guess that 208861 was the product of two prime numbers, one less than 400 (the subscription plus 1p) and the other greater than 400 (the number of members). The problem then involves discovering the factors (331 and 631).

The program in Listing 1 is convenient for this purpose, but the lengthy data statements are less convenient. If you used the program given last month to create an array full of primes, that can be used in place of the data. No more than the first 180 primes will serve for factorising numbers up to a million.

Listing 1. A solution.

```
100 CLS
110 DIM M(20)
120 INPUT A
130 RESTORE
140 LET X=A
150 LET M=1
160 FOR N=1 TO 79
170 READ D
180 LET P=X/D
190 IF P<>INT (P) THEN GOTO 240
200 LET M(M)=D
210 LET M=M+1
220 LET X=P
230 GOTO 180
240 NEXT M
250 IF X<>1 THEN LET M(M)=X:LET M=M+1
260 PRINT "The factors of ";A;" are;"
270 FOR N=1 TO M-1
280 PRINT M(N);
290 IF N<>M-1 THEN PRINT " x ";
300 NEXT N: PRINT
310 GOTO 120
320 DATA 2,3,5,7,11,13,17,19,23,29
330 DATA 31,37,41,43,47,53,59,61,67
340 DATA 71,73,79,83,89,97,101,103
350 DATA 107,109,113,127,131,137,139
360 DATA 149,151,157,163,167,173,179
370 DATA 181,191,193,197,199,211,223
380 DATA 227,229,233,239,241,251,257
390 DATA 263,269,271,277,281,283,293
400 DATA 307,311,313,317,331,337,347
410 DATA 349,353,359,367,373,379,383
420 DATA 389,397,401
```

The computer can thus be made to do the donkey work, but the method has to be decided first. Nor is the result of factorisation the final answer to the question posed, which asked how much was available to spend on the present. That will be the larger of the two factors, less one. It would have been possible to extend the program to provide that as the result, but the program would then become specialized, rather than of more general utility. As it stands, it could equally well be used to solve:-

'A hundred campers ran short of food, and some of them went out to forage among the local farms. Each brought back the same number of eggs, the total number of eggs being 5459. How many campers stayed behind in camp?'

Here, we run into a typical hidden snag. The computer can factorise 5459 and subtract the lesser factor from 100, but the answer could still be wrong, since nothing was said about [all] the rest of the campers staying in camp. Subtleties like that are hard enough to detect in manual working, but the computer - being ignorant of the tortuous workings of the human mind - could only pick them out if it was programmed to do so.

Another area in which the computer relies on outside help centres around the significance of the particular numbers used in a problem. For example:-

'A store held in stock 1386 Abdabs, 1092 Booboos, 1001 Clangers, and 1716 Doodaas. The price of each item was a whole number of pence, not exceeding 10. What were these prices, if the overall value was £397.42?'

The four quantities are the key to the matter. If you examine them carefully, you may see how to program the computer to work out most of the solution. A suggested program will be given next month.

SOME LIMITATIONS

Meanwhile, it will be interesting to consider some of the types of problem that are outside the scope of computer capabilities. One problem that has been a source of annoyance for years is about a series of roads fanning out from a given point, and intersected by two other roads. The solution blithely states that the roads form a 'harmonic pencil', on which basis the solution is simple. For those who have never heard of a harmonic pencil the problem is virtually insoluble, and the computer is in the same situation.

Some problems can be solved, in a rather laborious manner, by trying various combinations of variables in turn. This can be done by setting up a series of nested FOR loops, with the key calculation in the middle, but that approach is slow, and may not be completely valid unless coincidental values are ruled out.

A better approach may be to use the methods which have been developed over many centuries by campanologists (bellringers, for those without dictionaries). This essentially entails a series of exchanges. For a three-element set the changes might be

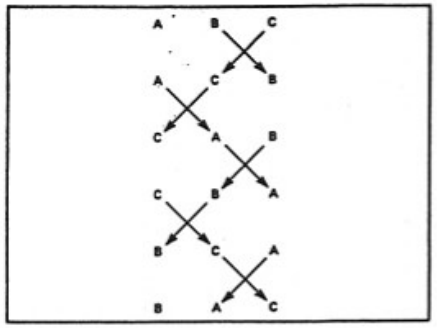

Fig.1. Exchanging Pairs Of Elements Gives All Possible Combinations.

as shown in Fig.1. When C comes 'home' to its original position, the sequence is complete. On the other hand, with four elements the sequence is shown in Fig.2. D has come home, but the sequence repeats after only eight of the 24 possible combinations.

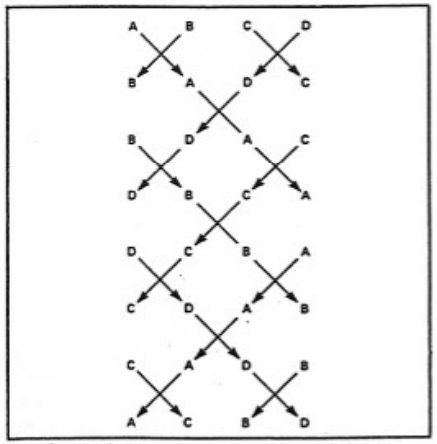

Fig.2. After 1 Set Of Changes, A 4-Element Set Has Used Only 8 Possible Combinations.

A variation is required, and this is obtained by exchanging only the right-hand pair, which sets up the next eight changes (see Fig.3). The variation is repeated to give the final eight.

The method can be extended to more elements, but unfortunately it seems to be impossible to obtain a manual on

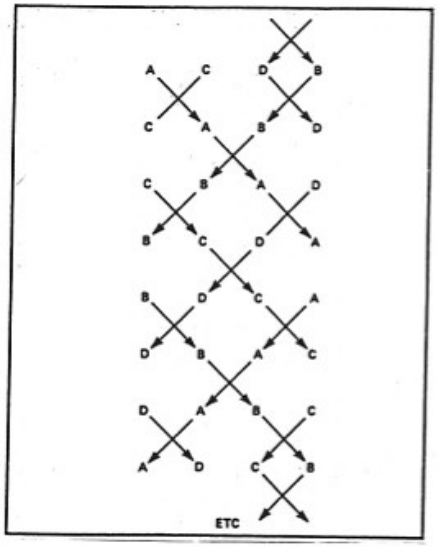

Fig.3. An Asymmetric Change Gives A 2nd Set Of 8.

the more complex methods, though there are no doubt well-thumbed copies in remote vicarages where the sound of bells is still tolerated. Otherwise, this type of routine would be useful for certain types of program.

THE INSIGHT STORY

Geometrical problems, which are often based on an obscure Euclidean rule or a subtle fiddle, are likely to beat both the computer and its programmer. There is the classic about a cylindrical hole, 6" long, through a sphere, which leaves a volume surrounding it that it is the same, whatever the size of the sphere. To discover this fact, you need to perform some complex calculus, and if you neither know the fact already nor can work out the mathematics the computer will be unable to help.

On the other hand, you scarcely need a computer to work out the volume of a sphere which has a diameter equal to the length of the cylindrical hole, which is the trick of insight required for a simple calculation of the constant volume (Fig.4).

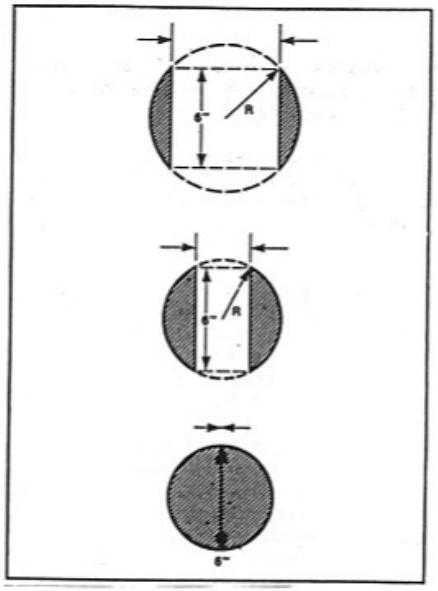

Fig.4. The Hole Through The Sphere is 6 Inches Long In Each Case.

The truth is that computers still have 'blind spots' in which they can look extremely inept, even if those who program them are able and willing to minimize the limitations. It must always be remembered that the inside of a computer can be isolated from the outside world, and thus is entirely dependent on the facts it contains.

It has been postulated that genuinely intelligent computers will never exist until a method can be devised for making them ask spontaneous relevant questions. The ability to ask pre-arranged questions is not enough, since the programmer might have forgotten something. Unfortunately, it has also been postulated that in order to be able to ask intelligent questions spontaneously a computer must first be intelligent, which creates a chicken and egg situation.

Until a way is found to break this deadlock, we will have to continue to think out in advance the questions which a computer needs to solve a given problem.

The HELP PAGE

Edited By:- Kevin Gould.

Welcome one and all to the March Help Page. Just before we start I was looking through back copies of Format to find a couple of answers and realised that there is often little or no comeback to answers given in these pages. The content of these pages depend on you writing with your problems, advice and hopefully answers.

It draws me to two conclusions which are (1) has the answer or advice given worked or (2) has the answer or advice not worked but you don't want to write again with the same question. If it is the first please, please, tell us, both Ray and I need to know that the information given works so that we can confidentally answer future questions. If it is the second then please write again, we may be able to offer further assistance but most importantly we have learnt for future occasions. On the last point, using the information, did you modify or ammend anything to answer the problem, if so, please tell us.

I have received a few letters on the ANIMATE article by Steve Warr which appeared in the January 1993 issue. It appears to produce an error (it does on mine +2a in 48K mode) that centres on line 70. If I am right, A$ is checking for the string "aceld". Mine displays on lines 23 & 24 (input area) BYTES: 39708 and FRAMES: 0. Irrespective which key I press to obtain one of the options I get the message 3 Subscript Wrong 70:1. I do not know the answer, I have not had time to phone Bob, however, I am sure that if there is an error it will be quickly corrected. [I've had no reports of errors here, anyone finding one please give me a ring. Bob.]

A couple of letters asking me what discs I use. I personally use Double Density Double Sided 80 track 3.5" formatted to 780K. I use G+DOS and where required a double directory (see DFLIP). As to make, basically anything that comes to hand. Originally I used JVC (MF-2DD) as we bought bulk JVC discs at work. We now have no buying policy biased to any particular make. Since I now buy my own discs they are unbranded. My last lot cost 50p each. Neither the JVC nor the unbranded have given me any trouble, valuable data such as W.P. files, Diary and backups are on both without bias. There was an article some time ago in FORMAT on the subject and it is worth another read. There are several unbranded ones at work which hold valuable data and have proved to be problem free. Personally, I object to paying for a transfer but that's me.. If you want to stick with a "name" which gives you a feel of "added security" thats fine. My most recent aquisition are ex P.C. Magazine cover-discs which simply needed re-formatting.

Evelyn Jerrard, thank you for your letter which I received from Jenny. I am sure you are neither a moron nor a simpleton (her words). I got your letter after sending my monthly disc to Ray. Your question will be answered by Ray next month. At least you know its being dealt with.

A letter now from Chris Turk regarding Spectrum +2 with PLUS D and Sharp MZ80 FDK double 5¼ disc drive. 1) The discs format to 330k, presumingly single sided, double density but some strange number of tracks. 2) If a disc is formatted in drive 1 it works O.K in that drive but gives error messages in drive 2, if formatted in drive 2 it works fine in both drives. When he formats in drive 1 and then re-formats in drive 2 he ends up with a disc that produces quite independent catalogues for each

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drive showing only files saved on that drive, the actual files get corrupted when something was saved on the other drive.

Well, the MZ80 is a very old machine (even older than the ZX81) so you would not be able to get technical information these days. However the answer here is almost certainly that the read/write head is totally misaligned on one or both of the drives. As they appear to be 40 track single sided drives they are not really worth the expense of having them set-up properly. Our advice is to invest in a new pair of drives.

Chris's letter went on to say. "Is it possible to get PLUS D programs on tape for transfer? I'm thinking of Artist 2 or any DTP/News-sheet programs."

The Artist 2 is now the only graphics program available, and then only on disc from FORMAT. But you could well find other (older) programs at shows on in FORMAT's Small Ads section.

Now a letter from Keith Bartlett regarding The Secretary. He is using a 512K SAM and Citizen 120D printer and is having printing problems with the Line/Box options from the Graph Menu.

When the Line/Box facility is selected from the Graph menu the result is a line of D's for the horizontal single lines and a row of m's for the double. For the vertical I get the figure 3 for the single and a colon for the double, as per below.

A figure 1 appears at the top left of a printout, it does not appear on the screen and I have not typed it in.

Ray: The Secretary uses the IBM character set instead of the Epson one which the 120D comes set to, and this enables line and box drawing to be carried out using characters rather than graphics. The characters being printed in the example you sent me are the Italic characters of the Epson set (with codes between 160 and 255), which have the same codes as the IBM line drawing characters. All you need to do is to set the printer DIP switches to the correct positions to give the IBM set. The appearance of the figure 1 at the start of the first line, suggests that the one of the control codes is being printed. Check again with your printer handbook that, where necessary, you have re-defined the printer codes to suit the Citizen 120D.

Now to Mr A.Price. Your first question regards Control Codes for the PLUS D from machine code, your second regards printer screen dumps on an Oki Microline 182 parallel printer, your third is the wiring of the PLUS D's printer port. Lets deal with these first in order:

Command Codes as they are known were covered by Bob in issues October & November 1988 (Vol 2 No 3 & 4) which are available from FORMAT. These cover all the codes: HXFER, OFSM, HOFLE, SBYT, HSVBK, CFSM, PNTP, COPS, HGFLE, LBYT, HLDBK, WSAD, RSAD, REST, HERAZ, COPS2, PCAT, HRSAD, HWSAD, OTFOC and PATCH plus they explain how to use them.

I do not know this printer though I have heard of it. The subject of printers is a continuing problem and has been covered many times in FORMAT since day 1. Your problem relates to software controlled screen dumps (i.e graphics packages) or the SAVE SCREEN$ 1 or 2. LLISTs and W.P letters are possible. The sample printout you sent shows all you get is 1 or 2 lines of the screen but as a mirror image. I checked the control codes for my printer (Mannesmann Tally MT80+) against the ones you sent me, I'm sorry to say none are the same. The majority of graphic codes are in the Decimal 3 area and mine shows none there.

Anyone got a Oki Microline 182? If yes, and your screen dumps work, please let us know.

And in answer to the last question. This is what the printer port pins

do:-

```
 1 Printer Strobe OUT
 3 Data 0 OUT
 5 Data 1 OUT
 7 Data 2 OUT
 9 Data 3 OUT
11 Data 4 OUT
13 Data 5 OUT
15 Data 6 OUT
17 Data 7 OUT
19 no connection
21 Printer Busy IN
23 no connection
25 no connection
```

Pins 2 to 22 (all even numbers) are all 0 volts (Ground)

This is the layout looking at the back of the PLUS D reading LEFT to RIGHT. Odd numbers on the top row, even on the bottom. It is the standard layout for ribbon cables and is often known as the BBC standard because their computer was one of the first to use it widely.

While on the subject of odd and even. Here is a slightly unusual question, I am sorry but I cannot remember who sent it. Most of this month's help page was typed at work during lunches. I had this letter on the edge of my desk, placed a pile of printouts on top of it which were then moved - along with the letter. The question was:-

A random number is required within a given range as LET A = INT (RND*52+1), however, the value of A must be checked using an IF THEN to see whether the value of A is odd or even. This apparently has some importance in the remainder of the program which I have not seen.

So, is it possible in BASIC on a Spectrum +2a in 48k mode to check for odd/even values. Well yes, quite easy really. Try this:-

```
10 INPUT "Give me a number ";N
20 LET ODD=N/2- INT (N/2)
30 IF ODD THEN PRINT N;" is odd"
40 IF NOT ODD THEN PRINT N;" is even"
50 GOTO 10
```

Thanks for the following:-

Using Tasword 2 with my printer it printed question marks at the start of each line, this problem can be rectified by adding POKE 60926,0 in the BASIC part. If you have a Spectrum +2A then when you are in +3 mode entering POKE 23659,0 will new the Spectrum and display the initial power up menu. This command can be used in your own programs. Lastly, thanks for solving the WEC Le-Mans problem, it now works fine and is the only game I have. It only works on a +2A in 128k and as a snapshot file.

A long letter has been passed on to me from Cliff Jackson of Hythe, Southampton. In short, his letter is about SAM's Comms Interface and Networking. I cannot personally add anything to what Ray replied except that FORMAT covered RS232 in November 87, Jan & Feb 89, Sept 91. If you still have problems then let Ray know.

And finally. A thank you to Malcom who sent a very long letter on VDUs with a diagram in answer to our appeal. A lot for me to type in so I could forward it to Ray on disc, but worth the effort. Malcom is the first, what about the rest of you.. Though please, on 3½" disc or tape (see writing to Help Page, February issue)

Addresses: **Answering a question (or providing info) on anything not SAM To:-**

Kevin Gould, Format Help Page,
2, Barleyfield Close, Heighington,
Lincolnshire, LN4 1TX.

Anything SAM related to:-

Ray Bray, Format Help Page,
'Elmsleigh' 4, Tidworth Road, Porton,
Salisbury, Wiltshire, SP4 0NG.

p.s. Re: Format February 92, Short Spot and Clyde Bish with DTP/ Tasword. Clyde, could you do me a great favour and send me through the program you have on 3.5" disc. I will return the disc and include an 18 or 24p stamp to reinburse your postage. Thanks, Kevin.

GAMES MASTER

Reviewed By:- Carol Brooksbank.

GAMES MASTER is a very comprehensive program for Sam games designers. It has its own sprite designer built in, or you can import sprites and scenery from any mode 4 screen, and it has a sound editor for producing any noises you require. Music and effects produced by THE SOUND MACHINE or MASTER BASIC can also be incorporated into your games.

The program uses its own language - similar to an extended BASIC - for the commands which control the game. These commands are entered in modules, and each module is compiled when you complete it, so that you can test the game as you go along. The game can be saved as a data file, which needs GAMES MASTER's Editor to be in place before you can run the game. Alternatively, you can save it as a full 'stand alone' game and which you can give to friends or market. One thing I liked very much - if you save as a full game and then decide you would like to make some changes, all is not lost. You can load it back into the Editor and work on it again. Similar programs I have used on the Spectrum always made you save a game twice, once in a form you could alter and once in a form you could run.

Module 1 is the one which begins the main spine of the game, You can order it to jump to another, or you can branch to "subroutine" modules which jump back to the one which called them on completion. Others may be set up to govern the happenings when sprites collide with each other, or when a particular time has elapsed, or when the score reaches a certain level. A module network can be tremendously complex, but is also tremendously versatile. Even BASIC subroutines can be called from within a module.

Sprites may be any size - though if they are wider than about half the screen you cannot edit the graphics. They generally need a mask - even static ones used as scenery need one if sprites pass behind them, or if they stand in front of something else. Only graphics which are pure background can get away unmasked, and all sprites will pass in front of background graphics. The program takes care of the masking - though if you want to play around with the masks to create shadow effects there is a manual override. The masking is excellent - even when sprites are passing over quite complex colour changes the effect is always smooth and realistic.

Sprites exist on collision planes. They will pass in front of those on a lower plane than their own, behind those on a higher plane, but may collide with those on the same plane. You can have several copies of the same sprite operating on different planes, and even one copy can exist on several. If two sprites collide, they will behave according to the properties you have given them - bounce, fall, stand still, etc., unless you set up a module to be executed at a particular collision. You can set up a table saying which module is to be executed when a particular pair of sprites collide. The module may contain instructions to perform a sound, transform one of the sprites into something else, make one of them disappear, move on to the next room - or whatever you like.

Collisions with blocks are handled in a similar way. Blocks can be anywhere you put them on screen, and on any plane or on several planes at once - they can be enclosing (they keep things in), or not (they keep things out), supportive (things will bounce off their edges) or not (things

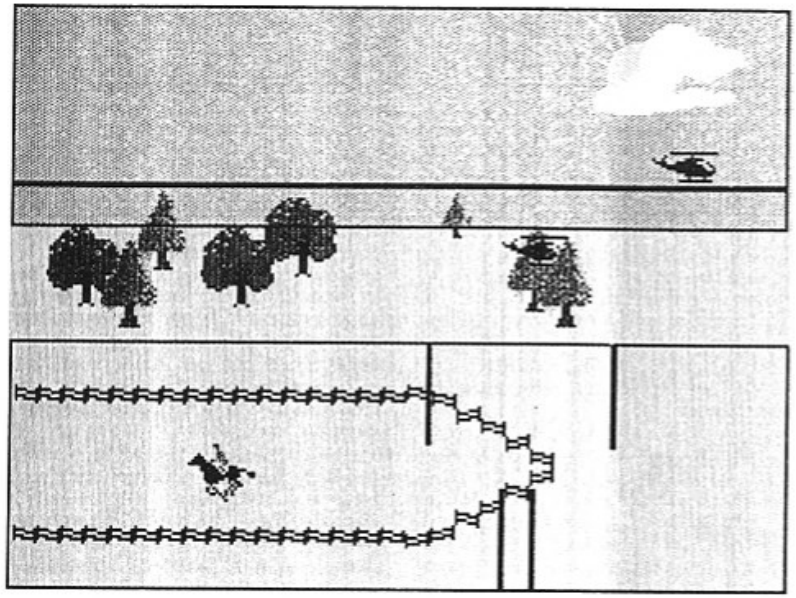

Fig 1.

will go straight through their sides). They can act as conveyor belts and they can be filled with colour or texture. Filling is very simple. You use the sprite editor to design a texture, and use an instruction to fill your block with it. When sprites collide with blocks they behave according to their inbuilt properties or according to a module., a second table of collision modules is kept - this time for sprite-v-block collisions.

Blocks and sprites are given their characteristics when you design them, but all can be changed from within modules as the game progresses. Animation frame sequences can also be complex - they are not limited to repeating the same frames in the same order. You can define a number of different sequences, one of which must be attached to every animated sprite, but like everything else about a sprite, it can be changed via pokes during the game.

Sprites can be handled automatically by the game processor or can be under the player's control through joystick or keyboard. You define the control keys. You can design very elaborate paths for a processor-controlled sprite to follow. I expected the "big picture" to keep coming around again when a sprite was following a path, but if it bounces off blocks or other sprites, or the path ends do not meet, or if the sprite is not confined to the screen area, the co-ordinates of the path change so often that its progress on screen can look quite random. You can also design your games so that there is a "limbo" area off screen in which sprites continue to follow their paths and bounce off each other when they leave the visible area, so their reappearance can seem quite unpredictable. Even blocks can protrude into this invisible area.

Fig 1 shows a very simple scene I used to test the program. The sun and cloud, and the fence, are graphic backgrounds. and the sky is a block filled with solid fill in blue, but all the other graphics are sprites with masks. I have left all the block lines visible. The two helicopters fly at different speeds, the top one moved

by a block acting as a conveyor belt and the other moving according to its inbuilt characterstics - it has its speed determined and it does not need support or respond to gravity. Both choppers fly off at the right and wrap around to the left. The lower one flies between the trees, but does not collide with them.

The horse gallops back and forth across the screen, being mirrored and having its direction of travel reversed when it collides with the side of its enclosing block. You only need to create sprite frames facing one way - the program will mirror them. The vertical lines on the right are blocks which make the horse jump the fence. When it gallops towards them, it passes under the first one and collides with the second which makes it rise. It then travels straight, passing over the other "up" one, until it collides with the second "down" one, and goes down again. The ones it missed on this pass will make it jump when travelling back again.

The folowing listing shows how few commands are needed to create this scene. Modules 1 and 2 set the scenery and start the moving sprites off. Once started they move without any further instructions. The blocks are designed from the blocks editor and need no commands to place them, though you can add, remove or change blocks from within any module.

```
*** MODULE 1 ***
PAL 1
BFILL 2,7
BACK 1,90,189,1
PLACE 3,0,146,2
ANIM 3,2,1
PLACE 8,5,120,1
PLACE 9,14,115,8
PLACE 2,10,118,4
ANIM 2,2,1
PLACE 8,40,130,1
PLACE 8,30,120,8
PLACE 9,80,120,1
PLACE 9,85,115,8
PLACE 11,20,130,1
PLACE 12,70,130,1
JPMOD 2
```

```
*** MODULE 2 ***
BACK 5,0,70,1
BACK 5,0,24,1
BACK 10,65,40,1
BACK 10,65,68,2
PLACE 4,0,45,16
ANIM 4,1,0

*** MODULE 100 ***
MIRROR 4
IF SPEEK(4,11)>100:SPEED 4,255,0
IF SPEEK(4,11)<50:SPEED 4,1,0

*** MODULE 101 ***
MOVE 0,0,3

*** MODULE 102 ***
MOVE 0,0,253

*** MODULE 103 ***
MOVE 0,0,3

*** MODULE 104 ***
MOVE 0,0,253
```

Module 100 turns the horse. It detects whether it was on the right or left of the screen by testing its x co-ordinate and then sets the appropriate speed and direction of travel. Modules 101 to 104 are the ones that make the horse jump - one for each of the blocks involved.

It looks very simple, but I have to say that it took me a long time to get things going properly. Don't imagine that you will be writing elaborate games five minutes after you open the manual. There is so much that this program can do, and you must study it, follow the tutorial instructions in the manual, load all the games from the disc, run them, examine their listing to see how things are done, and read the manual from cover to cover more than once.

The manual could do with a more comprehensive index. Several times I knew I had seen information about how to do something but could not find it again, because the contents list only gives option names. For instance, I knew I had seen somewhere that you could have a special module which was executed on every program cycle, but I did not know how to set it up. It took

me ages to find it because it was in EDIT GAME DETAILS option. And there are other things which might seem obvious to someone familiar with the program which need to be spelt out for the newcomer.

The EDIT SOUNDS option makes using Sam's sound chip much easier. The volume, pitch, tone/noise/tone+noise, and noise pitch are specified by a series of bars on a graph - one bar for every stage of the sound on each graph. During the running of a game sounds can be in stereo and a sound can be linked to a sprite so that it always appears to come from the sprite's position. Music is best prepared using THE SOUND MACHINE or MASTER BASIC and then called from the program.

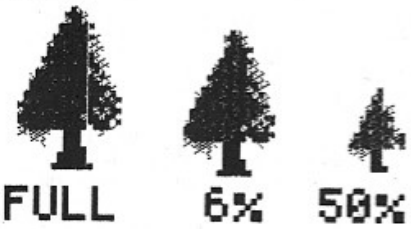

Fig 2. Sprite Size Reduction.

As well as a wide range of games and demos, there are some utility programs on the disc - one which generates random mountain scenery, for instance. Among these is a superb sprite reducer which will re-scale a sprite down by 6% - 50%, with various values in between. Fig 2 shows a tree reduced. Even 50% reduction is still perfectly recognisable as a tree and usable. I had expected a shapeless blob.

This is a splendid program, even if not very easy to learn to use. But if you're patient and take time to explore it, it is a first-class tool, very versatile and comprehensive. I have hardly scratched the surface of its capabilities in this review. If you want to know about everything it can do, buy it and work with it. It will more than repay the study you put in. See BETASOFT's advert on the back page for prices.

* * SMALL ADS * *

FOR SALE. I have one each of the following on tape at £1 each with S.A.E. Code Master Twin Turbo V8 48/128/+2/+3, Psion VU3D 48K, Quicksilva 3D Strategy 48K, ICL Club Record Controller Database 48k, Hewson Steam Train Simulator 48K. All will transfer to PLUS D for disc use. Money returned in S.A.E. if gone. Write to Kevin Gould, 2, Barleyfield Close, Heighington, Lincolnshire, LN4 1TX.

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YOUR LETTERS

Dear Editor,

Recently I have lost my Betterbytes Disc Manager disc, and my back up copy, due to a power cut when I was recopying my back up disc after corruption. As I have a master copy, (corrupt) of the disc, is it legal for me to copy somebody elses disc? If so will you please place the following ad in your wanted/for sale notices:- Wanted, Betterbytes Disc Manager, or somebody to copy program onto my original disc. Tel(0429) 235580.

I have phoned Dave Hood of Betterbytes to get another copy, but he was out when I phoned, the lady who answered the phone said he was still in business so I wrote to him, so far I have not had a reply.

Can I finish off by saying that I have recently dealt with Blue Alpha Electronics and the service was excellent, prompt and compared with local dealers, (before I had a choice), cheap, may I wish them every success, with the oncome of Sega and Nintendo, people forget the forerunner of these machines, the humble and still the best, the Spectrum.

Yours sincerely, H.Connell.

Anyone help? Ed.

- - - - -

Dear Editor,

For Christmas I got myself a Swift 9 colour printer to go with my Sam. My question is how do I get Flash to do colour dumps? I saw adverts in FORMAT for a bit of software some time ago but not in recent issues. Please help.

Yours sincerely, Mark Stevens.

You are in luck Mark, it just so happens that we have recently opened another box of bits and pieces we purchased from SAMCO's liquidator and have found some copies of the PBT Colour Dump. If anyone wants one then follow the instructions for ordering given on the Format Readers Service Page and quote order code SCD-04 at a price of £8.99. Ed.

- - - - -

Dear Editor,

I am in little doubt that a cartridge interface could be of use to SAM (and Speccy!) users. In the distant days of early Speccy development there were several games available in the form of ROM cartridges as well as tapes and these addressed the area of memory usually used by BASIC.

A ROM cartridge idea was worked out in the development of ATARI machines as well as one of the BBC options and even the ST has a side port just in case (though only a fast BASIC has been created for it so far!).

With the saving in memory and rapidity of loading one may use, for instance, a word-processor and the document maybe retained in high RAM while you took time out to play a quick game and you could return to the text for the database information, the word processed text, &c.

You could have other programming languages or even a "monitor" cartridge disassembly/hex-dump on screen/paper.

As for the high prices of the Ninsega games, it can only be up to us as organized and aware consumers/ creators of software to tame to mega-corporations and their massive retail mark-ups.

What the hell were you folk doing with the disgusting racist cartoon in your Winter issue??? SHAME ON YOU!!!!

Yours sincerely, John Johnson.

I'm sorry if our cartoon has caused offence to any Dalek readers. I know it is wrong to depict them as unloving/uncaring creatures and I will try to exercise more care in the

selection of cartoons in future.

Meanwhile, a ROM cartridge for SAM is one of the items West Coast are looking into both for games and serious software distribution. Ed.

- - - - -

Dear Editor,

I cannot leave Alan Cox unsupported. See his letter on Page 25 of January 1993 issue of FORMAT.

I too found the memory upgrade instructions very confusing. Mine was done about 2 years ago and I thought they would have been improved by now. Apparently not.

I have had considerable electronic experience but had difficulty in deciding which way round to put the IC. I was convinced that I had sussed it out and went ahead - but wrong way apparently! Switched off and inserted the chip the other way. It then worked and no problems encountered as a result of the error.

You say you have encountered no-one who has had difficulty in following the instructions. May I suggest that others have taken the same course as I did and have been relieved to find it working without holding a post mortem! At second attempt!

As I see it you have a fifty-fifty chance of getting it right first time. If it doesn't work you turn the chip round and don't admit to having been so stupid!

Anyway, Alan, you have the whole-hearted support now of at least one other stupid twit. Hope others come forward too! Twits of the world - UNITE.

Best wishes to INDUG and FORMAT.

Yours sincerely, Eddie Oates.

Something like 40 memory upgrades went out from here as a result of the special offer leaflet in the October issue and I have to be honest and say you are only the second person to have contacted us having experienced problems.

To test the instructions, after receiving Alan Cox's letter, I sent one to Jenny's son to fit to his SAM. No problems, in and working first time, in fact so simple is the fitting that the instructions were hardly referred to. Still if anyone gets one in future and feels they need help I will quite happily talk them through the procedure over the phone. Ed.

- - - - -

Dear Editor,

I would like to draw your attention to two of the firms who advertise in your "FORMAT" magazine.

1. On 19/3/92 I sent to PBT Electronics for a joy mouse. After waiting for weeks I received this, Inside was a letter stating "If you return the guarantee card to use we will dispatch the finished manual and an updated disk to you as soon as they become available". The guarantee card was returned immediately but no further word from them. I have tried phoning but get no answer. I again wrote to them on 23/11/92 and again letter has been ignored.

2. On 20/12/92 I sent a cheque made out to David Ledbury as instructed in his advert and my Indug No. to Sam Prime (Advert in Dec 1992 FORMAT) for Sam Prime and free copy of ZAT. As I had never received this I wrote again on 18/1/93 but still cannot even get a reply.

I would appreciate it if you could take up these matters as this is very unsatisfactory service from firms advertising in your magazine.

Yours sincerely, W.Ness.

PBT seem to have done a complete vanishing act - with several people after them for one reason or another (myself included for advertising bills). If we get more news we will let readers know.

On the second matter. Your letter above was dated the 30th January. Given that you ordered copies of publications (both of which are bi-monthly) with a letter that probably did not arrive until Christmas Eve (or even later) I really think you have jumped the gun in shooting of your letter to us so quickly. I know the people involved behind Sam Prime and Zat and I'm sure of their honesty. However you must appreciate that as they are a small amateur group running on a very low budget they would not have the resources that larger

organization would have.

If you have still not received your order from them by the time you read this give me a quick ring and I will try to contact them for you. Ed.

- - - - -

Dear Editor,

Just a quick letter to say thanks for the excellent magazine which I have only been getting since January this year. A friend of my dad used to have a Spectrum but upgraded (down-graded?!) to an Amiga 1200, and gave me about 35 back issues of FORMAT, which is what made me decide to subscribe.

Now a couple of questions. Firstly, does the number in the middle top of the address label mean when your last issue is due? If so, then I'm a bit confused. I've subscribed for a year, starting with January 1993, so my last issue should be December 1993, yet the address label says the number 1193, which of course means November 1993.

Secondly I didn't get a West Coast Computers mail shot in January. I only realised that one had been sent out around the start of February when someone told me they had got one earlier. I sent a letter to West Coast at the time but still didn't receive anything. Can you help?!

I've printed this letter out because I don't know how you'd prefer it sent; on disc or printed. I suppose sending it on disc would save some work somewhere (for Jenny?).

Time to go now, but please keep up the good work with the brilliant magazine.

Yours sincerely, Kev Cooper.

Long letters would be better on disc I must admit but then Jenny enjoys a bit of typing each month and when she's typing she can't bully me so much.

As to your expiry date, that has been covered many times before but I will just go over it again. 1193 tells our system to print out your label up to, and including, the print run at the end of November 1993 - which is when the labels for the December issue will be done. So you see it all works out right in the end. Ed.

Dear Editor,

Congratulations on your excellent publication, and I wish West Coast, Blue Alpha and yourselves all the best for the future. Keep the SAM alive.

Now to get down to business. At the end of 1991 (just over a year ago) I purchased the complete DTP Pack (i.e. Wordmaster, Typeliner, Headliner and the two font packs) from PCG. Costing me £50, I was pleased to receive my complete pack for my Spectrum +2A within a week, and even more pleased when I started to use it and found how excellent it was.

Anyway, in the middle of 1992, I was given a SAM Coupe 256K computer. I wanted to use my DTP pack on my new, superior machine, but, as it was the +2A version, I could not convert it. So, I wrote to PCG and asked if it would be possible to exchange my +2A version for the SAM disk version. Once again, I had a quick response (but PCG had become 'Polytype'), and was told it would be fine if I returned all original tapes plus £10. This seemed reasonable, and so it was that, at the start of January this year, I sent back my DTP Pack with cheque for £10, complete in its original library case (although I kept the three manuals). Three weeks later, I still had no SAM DTP Pack, yet, according to a bank statement, our cheque had been cashed.

After another week, we tried to phone PCG/Polytype, and eventually got hold of an evasive man who reluctantly told us Polytype weren't there anymore and had moved premises to somewhere else along the road. Unsure whether to believe him or not, we replaced the receiver and decided to turn to your good selves at FORMAT. What has happened to Polytype? What has happened to my DTP pack? What has happened to my ten pounds? Having had two previous reliable responses from the company, we did not expect these problems to occur. It's not so much the ten pounds I'm worried about - it's my fifty pound DTP Pack! Please help! (you're the only people we know who can!). Polytype's address and phone number (as I'm sure you know, are 11, Marsh Street (now supposedly 3, Marsh Street), Barrow-in- Furness, Cumbria, LA14 2AE, Tel. 0229 836 957.

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	13 London	Sandown Park, Esher, Surrey J9/10 M25
	20 North West	Haydock Park Racecourse J23 M6
	21 Scotland	City Hall, Candleriggs, Glasgow
	27 Hemel H/stead	Dacorum Pavilion, The Marlowes
	28 West	Brunel Centre, Templemeads, Bristol
March	6 Leicester	De Montfort Hall, Granville Road
	7 North	Univ. Sports Centre, Calverley St., Leeds
	13 North East	Seaburn Centre, Sea Road, Sunderland
	20 London	Sandown Park, Esher, Surrey J9/10 M25
	21 West Midlands	National Motorcycle Museum J6 M42
	27 North West	Haydock Park Racecourse J23 M6
April	3 Scotland	Adam House, Chambers St., Edinburgh
	4 Scotland	City Hall, Candleriggs, Glasgow
	11 Brighton	Corn Exchange, Church St.
	17 Nottingham	Jesse Boot Centre, University
	18 West Midlands	National Motorcycle Museum J6 M42
	24 London	Sandown Park, Esher, Surrey J9/10 M25
	25 West	Brunel Centre, Templemeads, Bristol
May	1 North East	Northumbria Centre, Washington, Dist. 12
	2 Leeds	Univ. Sports Centre, Calverley St., Leeds
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	30 West Midlands	National Motorcycle Museum J6 M42
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- - - - -

Dear Editor,

Thanks for the advance ticket to the All Format Show. When I got there about 9.30 a.m. with doors opening at 9.50 a.m. A notice on the entrance said there was only one room being used. I think there was more room in a tin of sardines. I hope the next show at the N.E.C. has a little more, or pipe oxygen.

Sorry about being handwritten but poor speccy being repaired.

Bought a copy of ZAT at the show not as good as FORMAT.

Keep up the good work, here's to a year of good reading.

Yours sincerely, D.Smith.

I hear the show was a bit crowded but I'm sure normal space will be resumed next time. The Motorcycle Museum at Birmingham, which is where the shows are held - right opposite the NEC complex, is the best of the All Format Show venues and when the normal three halls are open there is plenty of space. The museum also makes a good family day out as it is very interesting, covering the history and development of motorcycles. Ed.

- - - - -

Dear Editor,

I know its my fault for leaving the INDUG number off when I ordered something recently, but if you have it on your records, why not look it up?

Yours sincerely, R.Nutley.

Oh no, not that old chestnut again. Yes Mr Nutley we could look it up, but it could take considerable time to find it on the computer and while that search is going on the system can't be used for anything else.

We do clearly ask all members to quote their membership number WHENEVER they contact us so we have instant access to their records, not too much to ask is it? Ed.

- - - - -

Dear Editor,

Sorry I'm writing again after writing to you only a week or so ago. My subscription started in January but at the Haydock All Formats Fair in Haydock on the 20th February I bought a copy of the December 1992 FORMAT.

I'm writing in reply to Christopher Box who was after a book for the Spectrum. The book you are talking about Christopher is in fact called "Spectrum Interfacing and Projects" and has that distinctive silvery foil cover you talked about. The book was written by Graham Bishop and published by the McGraw Hill Book Company (U.K.) Limited of Shoppenhangers Road, Maidenhead, Berkshire (though because the book was printed in 1983 this may now be out of date). It's ISBN number is 0-07-084702-9.

I hope this helps him. However, if he still has difficulty in getting hold of it then please put him in contact with me and I will try and lend him my copy. I've also got the tape which I got with it which is full of all the programs which are in the book which saves you typing them in.

Yours sincerely, Kevin Cooper.

What a kind man. We have passed a copy of your letter on to Chris so he can get in contact with you. Ed.

* - * - * - * - * - *

Letters may be shortened or edited to fit on these pages.

This is YOUR letters page so it is up to you, our readers, to fill it. Keep letters as short as you can so we can fit in as many as possible.

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